The emerging functions of the p53-miRNA network in stem cell biology.

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Public Summary:
The p53 pathway plays an essential role in tumor suppression, regulating multiple cellular processes coordinately to maintain genome integrity in both somatic cells and stem cells. Despite decades of research dedicated to p53 function in differentiated somatic cells, we are just starting to understand the complexity of the p53 pathway in the biology of pluripotent stem cells and tissue stem cells. Recent studies have demonstrated that p53 suppresses proliferation, promotes differentiation of embryonic stem (ES) cells and constitutes an important barrier to somatic reprogramming. In addition, emerging evidence reveals the role of the p53 network in the self-renewal, proliferation and genomic integrity of adult stem cells. Interestingly, non-coding RNAs, and microRNAs in particular, are integral components of the p53 network, regulating multiple p53-controlled biological processes to modulate the self-renewal and differentiation potential of a variety of stem cells. Thus, elucidation of the p53-miRNA axis in stem cell biology may generate profound insights into the mechanistic overlap between malignant transformation and stem cell biology.

Scientific Abstract:
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